Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application:

Claims 1-14 (Canceled)

15. (New) An image optical system in which a plurality of light beams emerge from an image-forming device on a first conjugate plane having a divergence angle of 10° or greater, the beam being obliquely incident upon a second conjugate plane to form on the second conjugate plane an enlarged image substantially similar to an image formed by the image-forming device, said image optical system comprising:

a first optical system and a second optical system each having an optical axis,

the first optical system converging the plurality of light beams emerging from the image-forming device on both of a first light beam cross section arranged parallel to principal rays and a second light beam cross section intersecting the first light beam cross section,

the second optical system converging light beams passing through the first optical system on the second conjugate plane,

the image optical system, satisfying the following relationships:

(i) $S1 \leq L11 \leq S1 + S2$

(ii) $S1 \leq L21 \leq S1 + S2$

(iii) $L11/L1n < 0.25$; and

(iv) $0 < L21/L2n < 1.5$

wherein S1 is a distance from a point of emergence from the first optical system to a point of incidence of the second optical system along the optical axis of the first optical system; S2 is a distance from a point of emergence from the second optical system to the second conjugate plane along the optical axis of the second optical system;

wherein a maximum and a minimum of a distance between a point of convergence in the first and second light beam cross sections of a light beam emerging from the first optical system at a point nearest to the optical axis of the first optical system and the point of emergence from the first optical system are L11 and L21, respectively; and

wherein a maximum and a minimum of the distance between the point of convergence in the first and second light beam cross sections of a light beam emerging from the first optical system at a point remotest from the optical axis of the first optical system and the point of emergence from the first optical system are L1n and L2n, respectively;

16. (New) An image optical system in which a plurality of light beams emerge from an image-forming device on a first conjugate plane and having a divergence angle of 10° or greater, the beams being obliquely incident upon a second conjugate plane to form on the second conjugate plane an enlarged image substantially similar to an image formed by the image-forming device, said image optical system comprising:

a first optical system and a second optical system each

having an optical axis,

the first optical system converging the plurality of light beams emerging from the image-forming device on both of a first light beam cross section arranged parallel to principal rays and a second light beam cross section intersecting the first light beam cross section,

the second optical system converging light beams passing through the first optical system on the second conjugate plane,

the image optical system satisfying the following relationships:

(i) $S1 \leq L11 \leq S1 + S2$

(ii) $S1 \leq L21 \leq S1 + S2$

(iii) $L11/L1n < 0.25$

(iv) $0 < L21/L2n < 1.5$; and

(v) $D1 < D2$

wherein S1 is a distance from a point of emergence from the first optical system to a point of incidence on the second optical system along the optical axis of the first optical system;

wherein S2 is a distance from a point of emergence from the second optical system to the second conjugate plane along the optical axis of the second optical system;

wherein a maximum and a minimum of a distance between a point of convergence in the first and second light beam cross sections of a light beam emerging from the first optical system at a point nearest to the optical axis of the first optical system and the point of emergence from the first optical system are L11 and L21, respectively;

wherein a maximum and a minimum of a distance between the point of convergence in the first and second light beam cross sections of a light beam emerging from the first optical system at a point remotest from the optical axis of the first optical system and the point of emergence from the first optical system are L1n and L2n, respectively;

wherein D1 is a distance along an arbitrary light beam from the first optical system to the second optical system; and

wherein D2 is a distance along the arbitrary light beam from the second optical system to the second conjugate plane.

17. (New) An image optical system in which a plurality of light beams emerge from an image-forming device on a first conjugate plane and having a divergence angle of 10° or greater, the beams being obliquely incident upon a second conjugate plane to form on the second conjugate plane an enlarged image substantially similar to an image formed by the image-forming device, said image optical system comprising:

a first optical system and a second optical system each having an optical axis,

the first optical system converging the plurality of light beams emerging from the image-forming device on both of a first light beam cross section arranged parallel to principal rays and a second light beam cross section intersecting the first light beam cross section,

the second optical system converging light beams passing through the first optical system on the second conjugate plane,

the image optical system satisfying the following

relationships:

(i) $S1 \leq L11 \leq S1 + S2$;

(ii) $S1 \leq L21 \leq S1 + S2$;

(iii) $L11/L1n < 0.25$;

(iv) $0 < L21/L2n < 1.5$; and

(v) at least one of conditions expressed by

(a) $S1/L11 > 0.6$;

(b) $(S1 + S2)/L2n < 1$; or

(c) $\Delta SL > 0.6$

wherein S1 is a distance from a point of emergence from the first optical system to a point of incidence on the second optical system along the optical axis of the first optical system;

wherein S2 is a distance from a point of emergence from the second optical system to the second conjugate plane along the optical axis of the second optical system;

wherein L1 is a maximum of a distance between a point of convergence of an arbitrary light beam emerging from the first optical system in the first light beam cross section and the point of emergence from the first optical system;

wherein a maximum and a minimum of a distance between a point of convergence in the first and second light beam cross sections of a light beam emerging from the first optical system at a point nearest to the optical axis of the first optical system and the point of emergence from the first optical system are L11 and L21, respectively;

wherein a maximum and a minimum of a distance between the point of convergence in the first and second light beam cross

sections of a light beam emerging from the first optical system at a point remotest from the optical axis of the first optical system and the point of emergence from the first optical system are L1n and L2n, respectively; and

wherein ΔSL is a difference between the maximum and minimum of the ratio S1/L1.

18. (New) An image optical system in which a plurality of light beams emerge from an image-forming device on a first conjugate plane and having a divergence angle of 10° or greater, the beams being obliquely incident upon a second conjugate plane to form on the second conjugate plane an enlarged image substantially similar to an image formed by the image-forming device, said image optical system comprising:

a first optical system and a second optical system each having an optical axis,

the first optical system converging the plurality of light beams emerging from the image-forming device on both of a first light beam cross section arranged parallel to principal rays and a second light beam cross section intersecting the first light beam cross section,

the second optical system converging light beams passing through the first optical system on the second conjugate plane,

the image optical system satisfying the following relationships:

(i) $S1 \leq L11 \leq S1 + S2$

(ii) $S1 \leq L21 \leq S1 + S2$

(iii) $L11/L1n < 0.25$

(iv) $0 < L21/L2n < 1.5$;

(v) $D1 < D2$; and

(vi) at least one of conditions expressed by

(a) $S1/L11 > 0.6$;

(b) $(S1 + S2)/L2n < 1$; or

(c) $\Delta SL > 0.6$

wherein S1 is a distance from a point of emergence from the first optical system to a point of incidence on the second optical system along the optical axis of the first optical system;

wherein S2 is a distance from a point of emergence from the second optical system to the second conjugate plane along the optical axis of the second optical system;

wherein L1 is a maximum of a distance between a point of convergence of an arbitrary light beam emerging from the first optical system in the first light beam cross section and the point of emergence from the first optical system;

wherein a maximum and a minimum of a distance between a point of convergence in the first and second light beam cross sections of a light beam emerging from the first optical system at a point nearest to the optical axis of the first optical system and the point of emergence from the first optical system are L11 and L21, respectively;

wherein a maximum and a minimum of a distance between the point of convergence in the first and second light beam cross sections of a light beam emerging from the first optical system at a point remotest from the optical axis of the first optical system and the point of emergence from the first optical system are L1n

and L2n, respectively;

wherein D1 is a distance along an arbitrary light beam from the first optical system to the second optical system;

wherein D2 is a distance along the arbitrary light beam from the second optical system to the second conjugate plane; and

wherein ΔSL is a difference between the maximum and minimum of the ratio S1/L1.

19. (New) The image optical system according to claim 15, wherein the first and second optical systems have an imaging function of forming on the first conjugate plane a reduced image approximately similar to an image on the second conjugate plane.

20. (New) The image optical system according to claim 16, wherein the first and second optical systems have an imaging function of forming on the first conjugate plane a reduced image approximately similar to an image on the second conjugate plane.

21. (New) The image optical system according to claim 17, wherein the first and second optical systems have an imaging function of forming on the first conjugate a plane reduced image approximately similar to an image on the second conjugate plane.

22. (New) The image optical system according to claim 18, wherein the first and second optical systems have an imaging function of forming on the first conjugate plane a reduced image approximately similar to an image on the second conjugate plane.

23. (New) The image optical system according to claim 15, wherein the first and second optical systems include an optical element having at least one rotationally symmetric aspheric surface.

24. (New) The image optical system according to claim 16, wherein the first and second optical systems include an optical element having at least one rotationally symmetric aspheric surface.

25. (New) The image optical system according to claim 17, wherein the first and second optical systems include an optical element having at least one rotationally symmetric aspheric surface.

26. (New) The image optical system according to claim 18, wherein the first and second optical systems include an optical element having at least one rotationally symmetric aspheric surface.

27. (New) The image optical system according to claim 15, wherein the first optical system consist of refracting optical elements and the second optical system consist of reflecting optical elements.

28. (New) The image optical system according to claim 16, wherein the first optical system consist of refracting optical elements and the second optical system consist of reflecting optical elements.

29. (New) The image optical system according to claim 17, wherein the first optical system consist of refracting optical elements and the second optical system consist of reflecting optical

elements.

30. (New) The image optical system according to claim 18, wherein the first optical system consist of refracting optical elements and the second optical system consist of reflecting optical elements.

31. (New) The image optical system according to claim 15, wherein the first optical system consist of reflecting optical elements and the second optical system consist of refracting optical elements.

32. (New) The image optical system according to claim 16, wherein the first optical system consist of reflecting optical elements and the second optical system consist of refracting optical elements.

33. (New) The image optical system according to claim 17, wherein the first optical system consist of reflecting optical elements and the second optical system consist of refracting optical elements.

34. (New) The image optical system according to claim 18, wherein the first optical system consist of reflecting optical elements and the second optical system consist of refracting optical elements.

35. (New) The image optical system according to claim 15, wherein the first optical system and the second optical system consist of

reflecting optical elements.

36. (New) The image optical system according to claim 16, wherein the first optical system and the second optical system consist of reflecting optical elements.

37. (New) The image optical system according to claim 17, wherein the first optical system and the second optical system consist of reflecting optical elements.

38. (New) The image optical system according to claim 18, wherein the first optical system and the second optical system consist of reflecting optical elements.

39. (New) The image optical system according to claim 15, wherein all the light beams incident on the second conjugate plane are inclined at angles not smaller than 45° to a normal to the second conjugate plane.

40. (New) The image optical system according to claim 16, wherein all the light beams incident on the second conjugate plane are inclined at angles not smaller than 45° to a normal to the second conjugate plane.

41. (New) The image optical system according to claim 17, wherein all the light beams incident on the second conjugate plane are inclined at angles not smaller than 45° to a normal to the second conjugate plane.

42. (New) The image optical system according to claim 18, wherein all the light beams incident on the second conjugate plane are inclined at angles not smaller than 45° to a normal to the second conjugate plane.

43. (New) The image optical system according to claim 15, wherein the second optical system consist of a single optical element.

44. (New) The image optical system according to claim 16, wherein the second optical system consist of a single optical element.

45. (New) The image optical system according to claim 17, wherein the second optical system consist of a single optical element.

46. (New) The image optical system according to claim 18, wherein the second optical system consist of a single optical element.

47. (New) The image optical system according to claim 15, wherein the second optical system consist of a single reflecting optical element.

48. (New) The image optical system according to claim 16, wherein the second optical system consist of a single reflecting optical element.

49. (New) The image optical system according to claim 17, wherein the second optical system consist of a single reflecting optical element.

50. (New) The image optical system according to claim 18, wherein the second optical system consist of a single reflecting optical element.

51. (New) The image optical system according to claim 15, wherein the optical axis of the first optical system and the optical axis of the second optical system are on a common straight line.

52. (New) The image optical system according to claim 16, wherein the optical axis of the first optical system and the optical axis of the second optical system are on a common straight line.

53. (New) The image optical system according to claim 17, wherein the optical axis of the first optical system and the optical axis of the second optical system are on a common straight line.

54. (New) The image optical system according to claim 18, wherein the optical axis of the first optical system and the optical axis of the second optical system are on a common straight line.